

Transportation patterns of Aboriginal artefacts in the Shark Bay area, Western Australia

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Abstract

Artefact material at Aboriginal sites in the Shark Bay area is derived from various rock units exposed along the course of the Murchison River, as well as from local sources. The probable transportation pattern was from the Badgeradda area south-westward along the Murchison River at least as far west as the Ajana area, and then northward to Shark Bay. The maximum established transport distance is about 400 km for grindstones derived from the Badgeradda area. Coastal sites were occupied during the late Holocene, but one inland site may have been occupied prior to 6000 B.P., as a likely source of some artefact material is thought to be under the sea.

Introduction

During geological mapping in the Shark Bay area a number of previously unrecorded Aboriginal sites were briefly studied. All sites were marked by the presence of extraneous rocks as well as by shell fragments, and most of these artefacts were clearly worked. Apart from the recognition of grindstones, distinct flake tools and baler-shell scoops, no attempts were made to identify other tool types. The stone artefacts consist mostly of distinctive rock types which permit the identification of their source areas. The purpose of this note is to record this evidence concerning artefact source areas and to discuss the implied transportation pattern. Figure 1 shows the sites described and the geological units from which the artefacts were derived.

Site Descriptions

Site 1 (Shark Bay 1:250 000 map sheet, SG 49-8; grid reference 1239-7881) is located on top of red sand dunes at about 100 m from the sea. It is marked by two grindstones and by numerous shell fragments including baler shells. The larger grindstone measures about 40 cm x 30 cm x 5 cm, and consists of very-well-sorted, well-cemented, micaceous, silty sandstone of a characteristic greyish-purple colour. A chip from this grindstone was collected for petrographic comparison with likely source rocks, and it is petrographically indistinguishable from samples of the Yarrowolya Formation of the Proterozoic Badgeradda Group (Fig. 1; Geological Survey of Western Australia (GSWA) thin section No. 32048; reference sample Yarrowolya Formation GSWA 32070A).

The second grindstone consists of quartzitic, coarse-grained, moderately-sorted sandstone, identical in hand specimen to quartzitic sandstones that constitute the Woodrarrung Sandstone which is also part of the Badgeradda Group.

Site 2 (Edel 1:250 000 map sheet, SG 49-12; grid reference 1338-7631) is on top of low, white, calcareous coastal dunes at about 50 m from the shore. It is marked by shell fragments including baler-shell scoops, and a grindstone consisting of very-well-sorted, medium-grained, calcareous quartz arenite or quartzose calcarenite. This rock type is common along the shores of western Shark Bay in beach deposits of the Tamala Limestone.

Site 3 (Edel SG 49-12; grid reference 1392-7555) is located on top of low, white, calcareous dunes at about 100 m from the sea. Numerous shell fragments including baler-shell scoops, and stone artefact fragments are present at the site. Grindstone fragments consist of medium- and very-coarse-grained, quartzose calcarenites which are derived from various shallow marine and beach facies of the Tamala Limestone. A fragment of a quartzite pebble is similar to pebbles present in conglomeratic parts of the Permian Nangetty Formation.

Site 4 (Edel SG 49-12; grid reference 1505-6718), which was previously recorded by P. E. Playford (in Glover 1975), is on the south-eastern side of a large depression in between lithified dunes of Pleistocene Tamala Limestone. Water is present at shallow depth. The site is about 13 km south of the tidal flats at the southern end of Shark Bay, and less than 3 km from the steep Zuytdorp Cliffs. The varied artefact material is grouped according to source area.

The numerous shells including baler-shell scoops, are derived from nearby shores. Also of local origin are grindstones consisting of the well-sorted, quartzose calcarenite that forms the beach facies of the Tamala Limestone (cf. site 2), as well as calcrete flake tools and other fragments of pisolithic calcrete of a type that is common in the Tamala Limestone.

A second group of artefacts consist of grindstones of well-cemented, very-well-sorted, fine medium-, and coarse-grained quartz arenites, and pebble-sized

fragments of poorly lithified, moderately-sorted, sparsely pebbly, medium- to coarse-grained, red, feldspathic sandstone. The largest grindstone seen measured about 25 cm x 20 cm x 10 cm. Both rock types are characterized by a distinct sparkling appearance due to well-developed overgrowths on individual quartz grains. The Silurian Tumblagooda Sandstone which occurs along the Murchison River (Fig. 1) is the source of these rocks.

Chalcedony and various types of silcrete are present as flake tools and cores. Nearby outcrops of Tertiary silcrete and chalcedony along the eastern shore of Shark Bay are the most likely source. Another relatively nearby occurrence of Tertiary silcrete adjoins the outcrop area of the Tumblagooda Sandstone.

Pebbles of light grey chert, coarsely crystalline quartzite, and bright red jaspilite constitute the next group of artefacts. These pebbles are derived from con-

glomeratic parts of the Nangetty Formation, the nearest exposures of which are along the Murchison River. The basal Triassic conglomerate that crops out in the coastal cliffs south of the mouth of the Murchison River is too fine-grained to be the likely source of these pebbles.

Grindstones consisting of well-sorted, medium-grained and coarse-grained quartzite, and a pebble-sized fragment of well-cemented, very-well-sorted, greyish-purple, silty sandstone, are lithologically very similar to the grindstones at site 1. Derivation from the Woodrarrung Sandstone and the Yarrowolya Formation of the Badgeradda Group is therefore indicated.

A fragment of coarsely crystalline dolerite, similar in hand specimen to a grindstone reportedly found near Crayfish Bay, is either derived from dolerite dykes in the Proterozoic metamorphic rocks of the Ajana area,

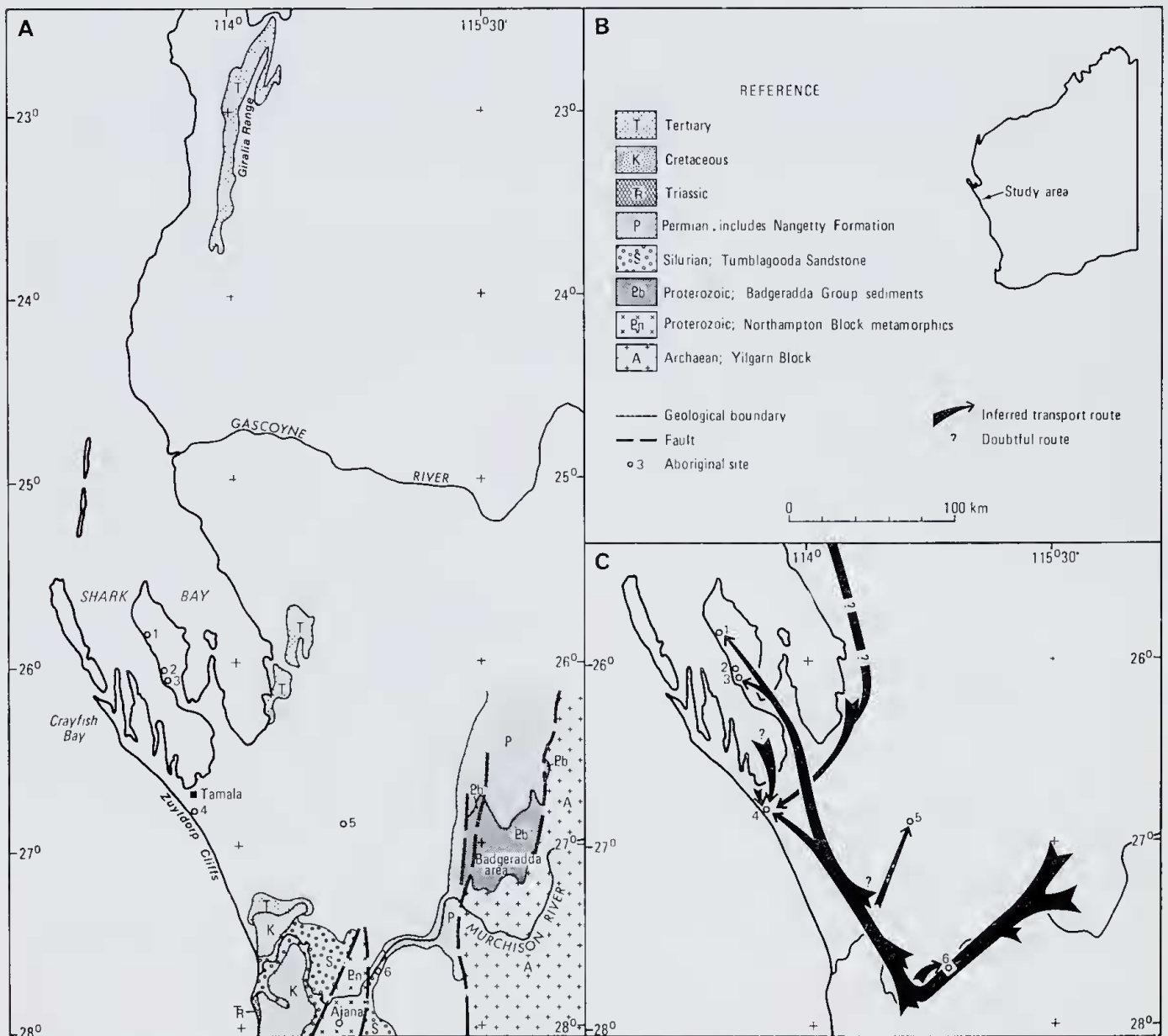


Figure 1.—A.—Location of Aboriginal sites, and potential source rocks of stone artefacts. B.—Reference. C.—Inferred transport patterns of Aboriginal artefacts.

or from similar dolerites that occur in the Archaean rocks to the east of the Badgeradda area. A pebble-sized fragment of ultramafic composition is also most probably derived from these Archaean rocks (GSWA thin section 32086 C).

The last group consists of very-fine-grained (micritic) sparsely-fossiliferous limestones. Fragments of white, micritic limestone with scattered foraminifers and bryozoans, light-grey, pelletoidal limestone with scattered bryozoans and echinoderm debris, (GSWA thin sections 32086 A, B) and greenish-grey, fossiliferous limestone were found. A. E. Cockbain (written comm.) considered the first two varieties to be of probable Early Tertiary age and lithologically similar to Palaeocene limestones known from several deep bores in the Shark Bay area. Fragments of bryozoal chert, including a large core, lithologically similar to artefacts of Eocene chert which are common in the Perth Basin area, were also collected from this site by P. E. Playford (in Glover, 1975).

The nearest known outcrops of similar Tertiary (Palaeocene) limestones are in the Giralda Range about 440 km to the north of this site. However, as all the other artefacts from this locality have either a local or a southern source, this evidence of long-distance transport from the north is not considered to be conclusive. The alternative interpretation is that these rocks are derived from presently submerged exposures of Palaeocene rocks within the Shark Bay area. In other words, they may have been brought to this site before sea level reached its present height about 6000 years ago, as was suggested by Glover (1975) for the Eocene chert artefacts found in coastal parts of the Perth Basin. Detailed petrographic and palaeontological work on artefacts, subsurface, and surface samples is now needed to confirm this interpretation.

Site 5 (Yaringa 1:250 000 map sheet, SG 50-9; grid reference 2530-6618) is in typical red sandplain country, and consists of several tens of fragments and flakes of intensely silicified, Cretaceous Windalia Radiolarite. The nearest known outcrops of silicified Windalia Radiolarite are about 80 km to the south near the Murchison River.

Site 6 (Ajana SG 50-13; grid reference 2779-5620) is located on an alluvial flat about 100 m from the Murchison River. Artefact material at this site comprises

a grindstone as well as silcrete and quartzite flakes and chips. The silcrete and quartzite are derived from nearby outcrops, but the grindstone which consists of garnetiferous granulite has been brought upstream for at least 10 km from the high-grade metamorphic rocks of the Ajana area.

Discussion and conclusions

Aboriginal stone artefacts, for which the Murchison River Valley is the source area, are common in the Shark Bay region. Combined with the knowledge of Aboriginal occupation of the Murchison valley this is strong evidence that artefact material was carried from the Badgeradda area south-westward along the Murchison River at least as far as the Ajana area and then northward to Shark Bay. The alternative possibility that material from the Badgeradda area was transported along a straight-line route to the Shark Bay area is thought to be unlikely. Following the Murchison River would have had the advantage of reducing the distance without reliable water supplies to about 100 km, as against nearly 200 km for a straight-line route. The maximum transport distance implied by this suggested route is about 400 km for grindstones which originated in the Badgeradda area, as compared to a straight-line distance of about 250 km. As well as this extraneous artefact material, locally derived materials are also present at the sites described.

The location of Sites 1, 2 and 3 along the present-day shore suggests that occupation of these sites occurred after the Holocene transgression reached present sea level. Site 4, however, may have been occupied before 6000 years B.P.

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Reference

- Glover, J. E., (1975).—The petrology and probable stratigraphic significance of Aboriginal artefacts from part of south-western Australia. *J. R. Soc. West. Aust.*, 58: 75-85.